

## ABSTRACT

There is provided a process of preparing hydrogen through thermochemical decomposition of water capable of supplying a mixture composed of the impalpable powders of CaO and coal directly to a main reactor. The process of preparing hydrogen through thermochemical decomposition of water, wherein coal powders are caused to react with water in the presence of CaO under a condition of temperature in a range of 600°C to 800°C substantially without an oxidizing agent added thereto, thereby reducing water to form hydrogen, said process comprising the steps of rendering the coal powders and CaO into impalpable powders to form mixed impalpable powders, feeding steam generated from a steam generator and the mixed impalpable powders to a fluidized bed of a main reactor, and implementing thermochemical decomposition of water in the main reactor by causing the mixed impalpable powders of the coal powders and CaO to undergo grain growth in the fluidized bed while adjusting a steam partial pressure in the main reactor so as to be suited for a condition enabling CaO to form  $\text{Ca Ca(OH)}_2$ .